Science Flight Report
Operation Ice Bridge August 2011

UAF Alaska Flight No 10
Mission Plan: Juneau Icefield and Yakutat Icefield.

Flight Report Summary

Aircraft	**DHC-3 Otter**
Flight Number	UAF-10
Flight Request	11M009
Flight Hours	8.0
Take off time	8:00:00.00 Z from near Juneau
Landing time	16:00:00.00 Z Ultima Thule Outfitters
Date	Sept 11 2011, Day of Year 254
Purpose of Flight	LiDAR surveys of Juneau Icefield and Yakutat Icefield.
Aircraft Status	Airworthy.
Sensor Status	operational.
Significant Issues	None.
Accomplishments	• LiDAR profiles of the Juneau Icefield and the Yakutat Icefield. DMS images were acquired coincident with the LiDAR data.
Planned Events	• The next surveys will be in Icy Bay.

Science Data Report Summary

This mission completed LiDAR surveys of the Juneau Icefield that had begun the day before. After these surveys were done, we flew the Yakutat Icefield on the return flight, saving ferry time in the process. LiDAR data were collected at a height of 500-650 meters above the glacier surface, and mapped a 0.5 km wide swath along the centerline of the glaciers. This swath map consists of measurements from individual laser shot points on a roughly 1 meter by 1 meter grid. The individual point measurements of the glacier surface latitude, longitude and elevation have an accuracy of approximately ±10 cm.
The DMS imagery acquires distortion-calibrated images with 70 percent overlap, covering a swath width identical to the LiDAR, with 10 cm resolution (pixel to pixel spacing) on the ground. The DMS images are directly coupled with the LiDAR IMU, so precise timing, position and pointing angles (aircraft attitude) are recorded with every image.
Geographic keywords: (Juneau Icefield, Alaska)
Repeat Mission: yes (2007, 2000, 1995)

Instrument	Instrument Operational		Data Volume for days 254	Instrument Issues
	Target area	Entire Flight		
UAF LiDAR	Yes	No	~4.0 GB in raw binary format	None
GPS	Yes	Yes	~1.2 GB in raw binary format	None
IMU	Yes	Yes	~700 MB in raw binary format	None
DMS	Yes	No	~50 GB in jpeg format	None

Mission Log (Chris Larsen)

Today's mission completed LiDAR surveys of the Juneau Icefield. Calm and clear conditions were present through the flight. Finishing early, we decided to survey the Yakutat Icefield on the return. This saved considerable ferry time over doing the Yakutat Icefield as a separate mission. People onboard included Paul Claus (pilot), and Chris Larsen.
The flight was ended at Ultima Thule Outfitters.

Individual instruments on board the aircraft:
LiDAR: The UAF LiDAR system worked well.

GPS: System worked normally. No problems.

IMU: System worked well. No issues.

DMS: System worked well. No issues.

Figure 1: LiDAR ground tracks on the Juneau Icefield.

Figure 2: LiDAR ground tracks on the Yakutat Icefield.